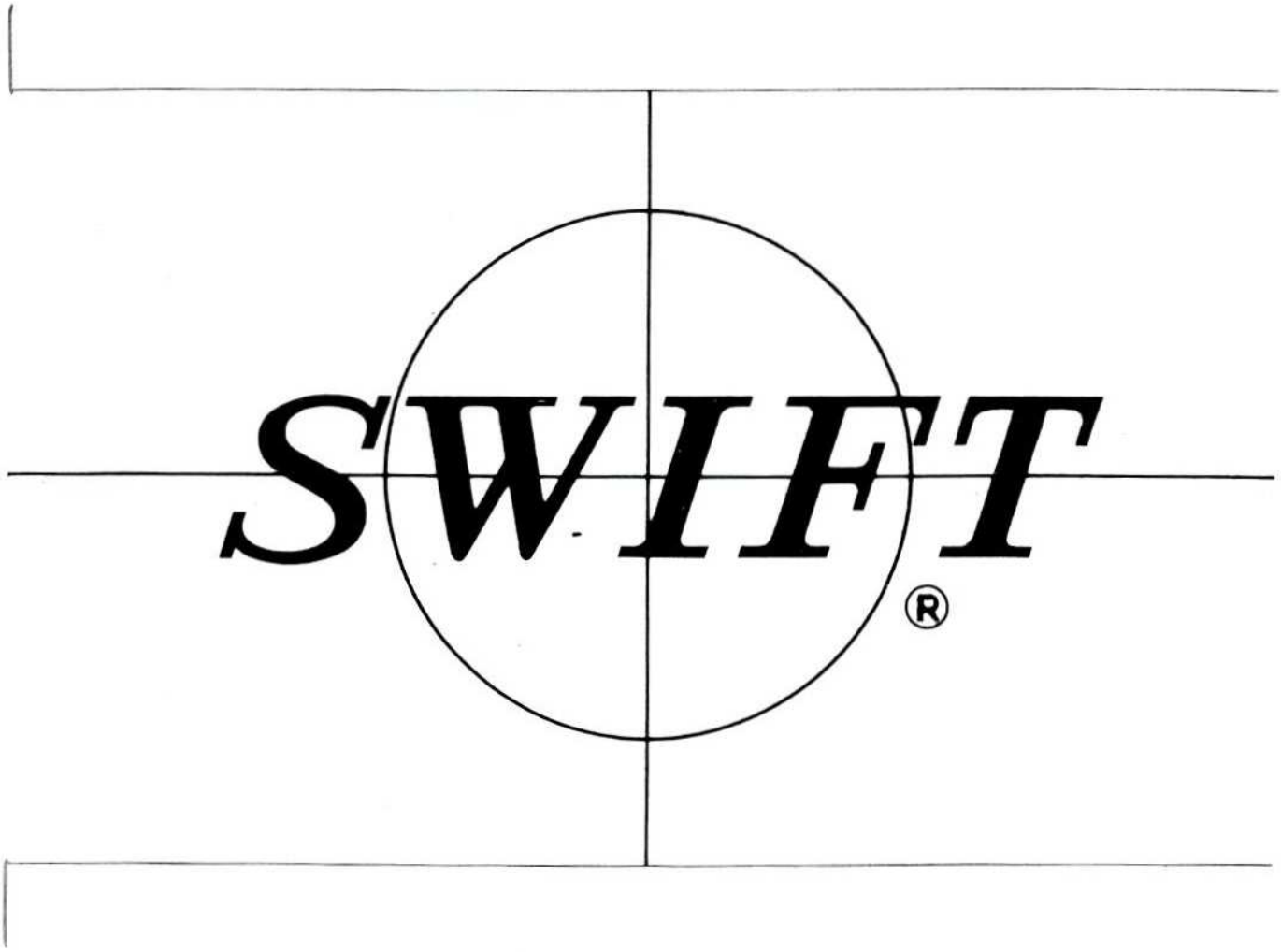
USE AND CARE OF SWIFT M4000D SERIES

MEDICAL-BIOLOGICAL MICROSCOPE



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USE AND CARE OF SWIFT M4000D SERIES MICROSCOPE

Your SWIFT M4000D Series microscope is an instrument of precision, both optically and mechanically and will last a lifetime with a minimum of maintenance. It is built to the highest and most rigid optical and mechanical standards and has many built-in features to insure durability and high performance in the hands of both student and professional users. It is designed to withstand the rigors of daily use with only normal care.

Unpacking: Your SWIFT M4000D Series microscope arrived packed in either a fitted cabinet or molded styrofoam container. The objectives may be in sealed plastic vials and care should be taken not to drop them or allow your fingers to contact the lenses. Install the objectives in a clockwise direction from the lowest to the highest power.

Familiarize yourself with the components of the microscope.

Arm:	The frame that supports all components above the base.
Body:	The unit comprising the inclined eyetubes and prisms which control the path of light to the eyepiece.
Objective:	The optical system which does the initial magnifying to form the primary image.
Nosepiece:	The revolver which carries the objectives.
Eyepiece:	The upper optical components that further magnify the primary image and brings the light rays to a focus at the eyepoint.
Condenser:	The optical lens built below the center of the stage.
Stage:	The table of the microscope on which the specimen is placed.
Base:	The component which supports the entire instrument. This component includes an illuminator which directs light through the condenser to the specimen.

Important terminology common to the science of microscopy:

Compound microscope: a microscope having a primary magnifier (the objective) and a secondary (the eyepiece) to further magnify the image and bring the light rays to a focal point (the eyes).

Achromatic Objective: an optical system corrected for two colors chromatically and one color (yellow-green) spherically.

Angular Aperture: the angle (or cone) of light rays capable of entering the front lens of the objective from a point in the object. By

increasing the angular aperture of an objective more light rays from the specimen can be taken in by the lens, hence the resolving power is increased.

Numerical Aperture (N.A.): a mathematical formula devised by Ernst Abbe for the direct comparison of dry and all types of immersion objectives for resolving power. Numerical aperture (N.A.) is the sine of half the angular aperture of the objective multiplied by the refractive index of the medium between the front lens of the objective and the cover glass on the slide. Numerical apertures of all SWIFT objectives are of research quality.

Condenser: a lens or system of lenses to collect light rays and converge them to a focus. Condensers are available for the M4000D Series as follows – N.A. 1.25 Abbe Condenser with iris diaphragm and swing out filter carrier. Condensers available for the Quodlibet System of Phase Microscopy (instantly convertible to dark or brightfield) are as follows: MA403D N.A. 1.25 Condenser with 5 aperture disc and phase annulus compatible to and including Phase 10xD and Phase 40xD Objectives. MA404D same as MA403D with addition of Phase 100xD Objective.

Cover Glass: thin glass cut in circles, rectangles or squares, for covering the specimen, usually a thickness of 0.17 to 0.18mm. The majority of specimens should be covered by a cover glass, and this is a necessity when using the 40x and 100x lens.

Depth of focus: the ability of a lens to furnish a distinct image above and below the focal plane. Depth of focus decreases with the increase of numerical aperture or with the increase of magnification.

Eyepiece: the lens near the eye which magnifies the primary image of the objective so as to form a virtual image 10" away from the eyepoint.

Field: the area of the object that is seen when the image is observed. It may range in diameter from several millimeters to less than 0.1mm. Also the size of the diaphragm opening in the eyepiece governs the diameter of the field of view.

Focal length: parallel rays of light after refraction through a lens will be brought to a focus at the focal point. The distance from the optical center of the lens to the focal point is the focal length or focus.

Objective: the lens system near the specimen which forms the primary image.

Parfocal: a term applied to objectives and eyepieces when practically no change in focus has to be made when one power is substituted for another. The objectives on your SWIFT M4000D Series microscope are parfocalized at the factory so that only a slight movement

or no movement at all of the fine focus control is required when a change is made from high to lower powers.

Resolving Power: the ability of a lens to clearly separate fine detail. Resolving power is directly proportional to the numerical aperture of the objective. Also the shorter the wavelength of the light used, the greater the resolving power of the optical system.

$$\text{Resolving power} = \frac{\lambda}{\text{N.A.}} \quad \text{when} \quad \frac{\lambda}{\text{N.A.}}$$

λ = wave length of light being used.
N.A. = numerical aperture.

Widefield Eyepiece: is generally an ocular with an achromatic doublet for an eyelens and with the plano side of the lower lens nearest the objective. Such a corrected system does not have to be stopped down with a diaphragm, hence a large, flat field is assured.

Working Distance, Free: the distance between the front lens of the objective and the cover glass when the lens is focused on the specimen.

Coarse Focus: this is the large knob found on each side of the microscope and is used for rapid movement of the stage to bring the specimen near to focus.

Fine Focus: the smaller knobs within the larger coarse focus knobs. Fine focus controls are used to precisely focus the specimen to produce the sharpest image.

Tension Control: This is the large thin knurled wheel knob between the coarse focus knob and side of arm – slight turning clockwise or counter clockwise will increase or decrease focus tension and or sensitivity.

USING YOUR SWIFT M4000D SERIES MICROSCOPE

Most models of M4000D Series microscopes will be equipped with widefield 10x eyepieces, objectives 4xD, 10xD, 40xRD, 100xRD and N.A. 1.25 condenser with iris diaphragm and swing out filter holder.

These models are used as follows:

1. Secure the slide to the stage with spring fingers.
2. Revolve the nosepiece to position the lowest power objective.
3. View through the eyepiece and use the coarse focus control to bring the specimen nearly into focus. The fine focus control is now

used to complete the focusing of the specimen to produce the sharpest image.

4. The iris diaphragm is not intended to control the brightness of the illumination but induces contrast into the specimen by diffracting light rays. Focusing of the specimen should be done with the iris diaphragm opened to its largest aperture. If additional contrast is required to permit accurate viewing of the specimen, the diaphragm should be slowly closed until the details of the specimen are sharply defined. Care should be taken not to use an aperture too small to gain high contrast, as then fine structure of the image will be destroyed. Reducing the aperture does increase contrast and depth of focus, but it also reduces resolution and introduces diffraction. The aperture must be selected for each objective: i.e. the aperture for the 10xD (N.A. 0.25) objective will not be the same as for the 40xD (N.A. 0.65), since the angle of light required is determined by the numerical aperture of the objective. Proper adjustment of the diaphragm aperture is easily determined after a little experience with the microscope.

The rule governing condenser numerical apertures is: the numerical aperture of the condenser must be equal to or greater than the numerical aperture of the highest powered objective. In this instance, the 100xD oil immersion objective has an N.A. of 1.25. Thus, the Abbe condenser (N.A. 1.25) is required to utilize the full resolving power of the objective. The iris diaphragm provides a continuously variable increase or reduction of the diameter of the cone of light from the illuminator. Proper focusing of the N.A. 1.25 condenser is important and is accomplished as follows:

1. Raise the condenser to its upper limits of focus. The iris diaphragm should be fully opened.

2. Focus the specimen with the 10xD Objective. (The diameter of the cone of light should fill the back lens of the objective. This utilizes the full resolving power of the objective. However, most specimens react better to a cone of light approximately 3/4 the diameter of the back lens of the objective).

3. Remove the eyepiece and view the cone of light visible on the back lens of the objective.

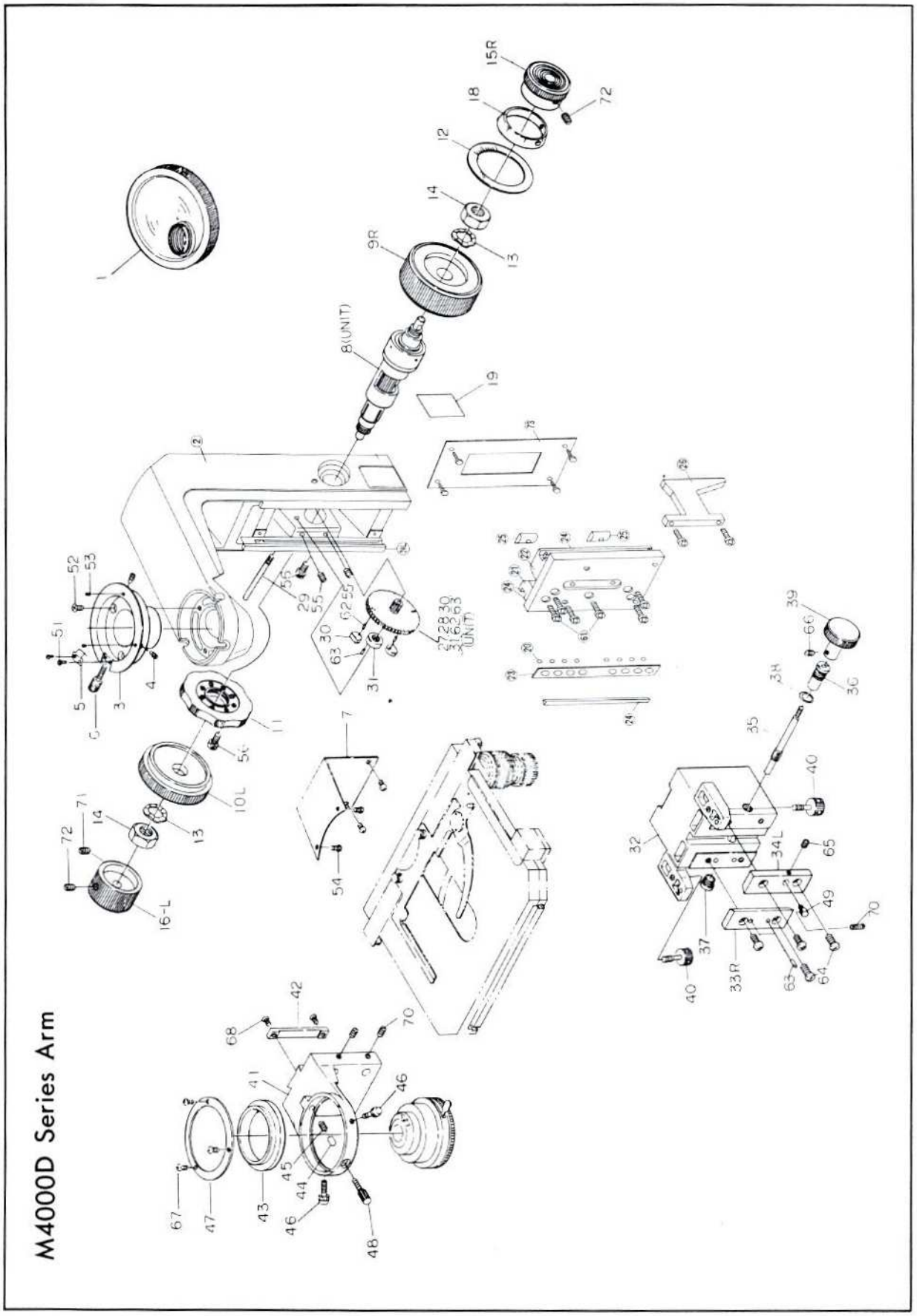
4. Lower the condenser to achieve a cone of light approximately 3/4 the diameter of the lens.

5. Replace the eyepiece and view the specimen.

6. If additional contrast is required to permit study of the specimen, the iris diaphragm may be closed slightly.

7. It is necessary to exclude air from the space between the cover glass over the specimen and the front lens of the 100xD objective. This is accomplished by placing a drop of cedarwood oil, or

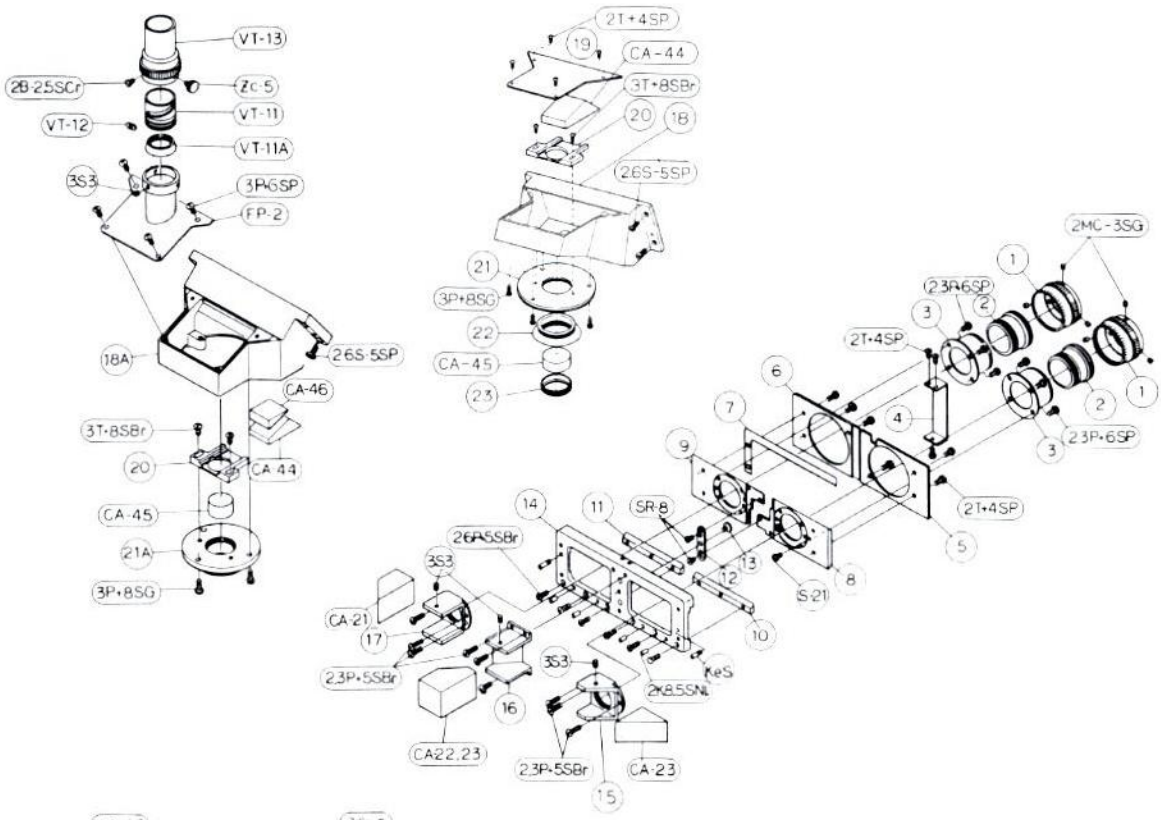
M4000D Series Arm

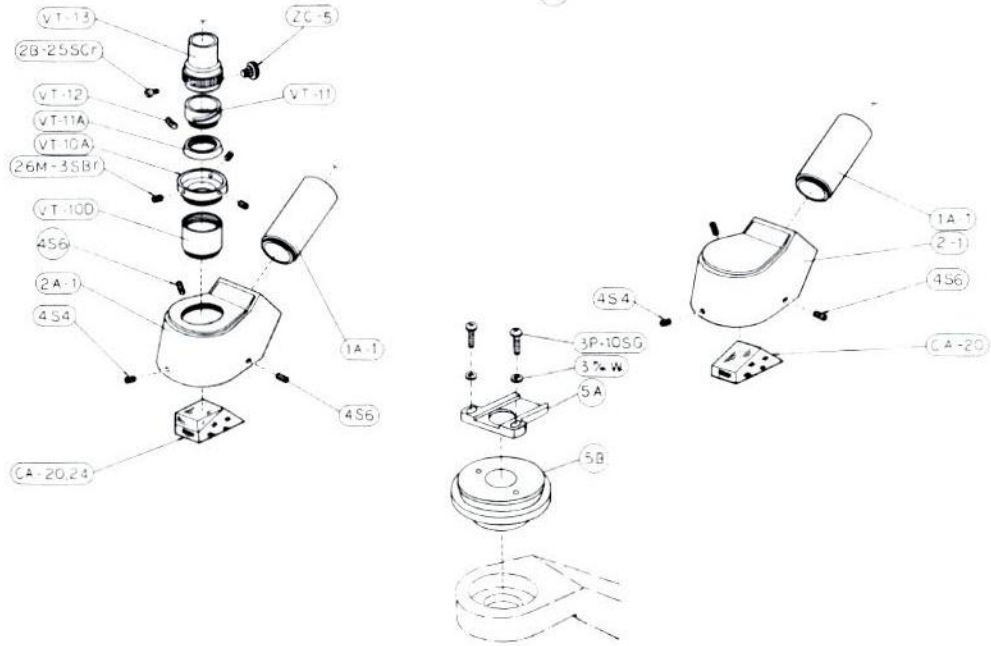


Part Number	Description	Part Number	Description
1	Nosepiece	29	Shaft
2	Arm	30	Metal
3	Nosepiece Seat	31	Nut
4	Centering Screw	32	Stage Holder
5	Spring	33	Slide, right
6	Set Screw	34	Slide, left
7	Arm Cover	35	Pinion
8	Pinion Assembly	36	Bushing
9	Coarse Adj. Knob	37	Screw
10	Coarse Adj. Knob	38	Washer
11	Tension Knob	39	Knob
12	Graduated Plate	40	Screw
13	Spring Washer	41	Condenser Holder
14	Nut	42	Rack
15	Fine Adj. Knob (R)	43	Sleeve
16	Fine Adj. Knob (L)	44	Metal
18	Graduated Ring	45	Spring
19	Marking Plate	46	Screw
20	Holder Block	47	Sleeve Ring
21	Liner	48	Screw
22	Slider	49	Adjusting Screw
23	Cross Roller	51	2F + 3SP Screw
24	Triangular Rail	52	3F + 6SP Screw
25	Joint Plate	53	1.7MC-3SG Screw
26	Rack	54	2T + 4SP Screw
27	Gear	55	4S6 Screw
28	Gear	56	3C6 Screw

Part Number	Description	Part Number	Description
57	4P + 10SP Screw		
58	4P + 8 SP Screw		
59	1.7P + 4SP Screw		
60	4P + 8SP Screw		
61	3P + 6SG Screw		
62	1.5K5SG Pin		
63	ZK5SG Screw		
64	3P + 6SG Screw		
65	3S6 Screw		
66	2.6MC-3.5SG Screw		
67	1.7P(0) + 4SG Screw		
68	2.6F + 6SP Screw		
69	3S4 Screw		
70	Screw		
71	4S6 Screw		
72	4S8 Screw		
73	Arm Cover		

M4000D Series T and B Body
M4000D Series Monocular Body
M4000D Series Teaching Body





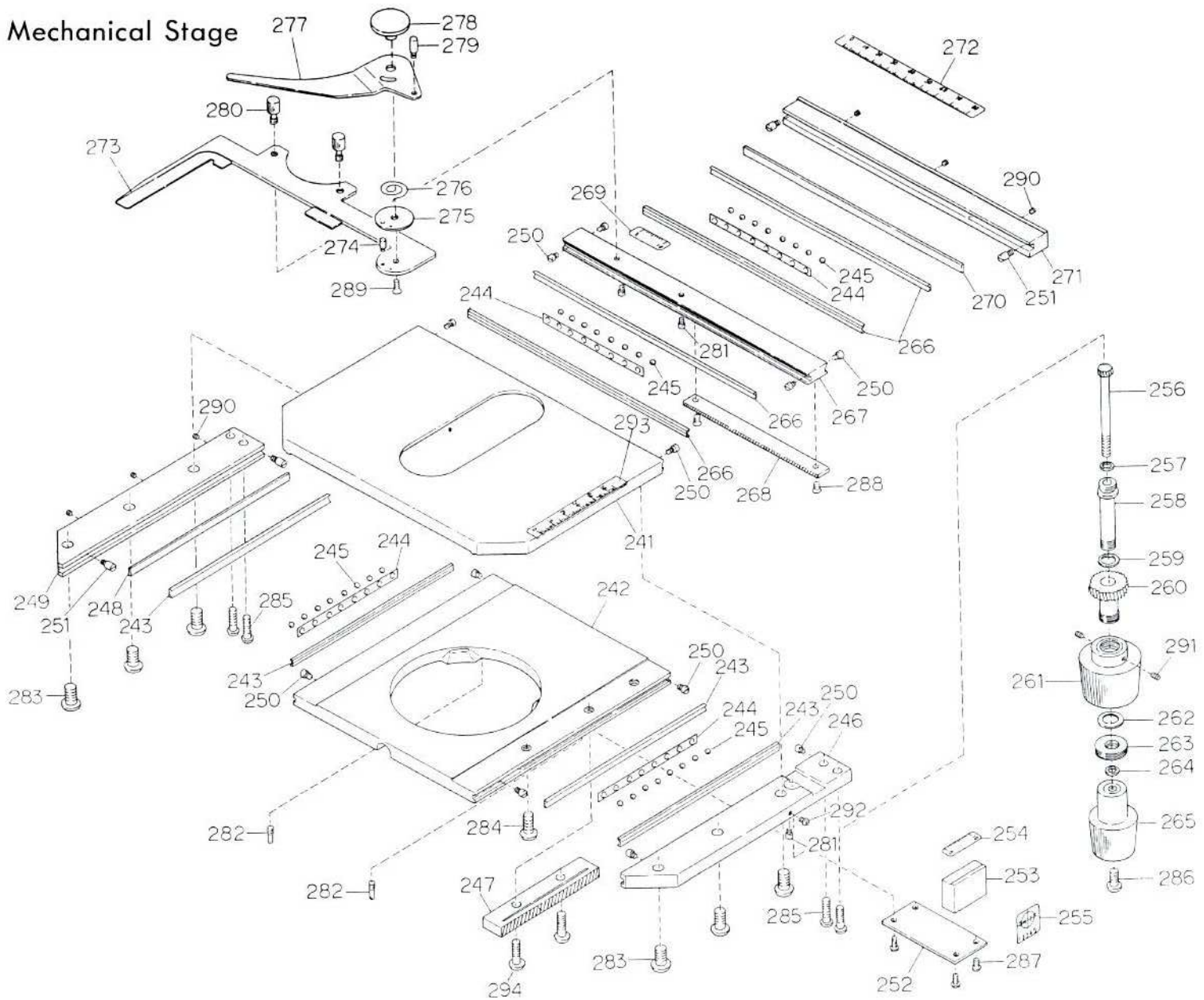
M4000D Series T and B Body PARTS LIST

Part Number	Description	Part Number	Description
2MC-3SG	Screw	17	Prism Case
1	Graduated Tube	2.3P+5SBr	Screw
2	Inner Tube	2T+4SP	Screw
2.3P+6SP	Screw	19	Plate
3	Lower Tube	CA-44	Prism
13	Screw	3T+8SBr	Screw
SR-8	Screw	20	Prism Seat
12	Link	18	Binocular Body
2T+4SP	Screw	2.6S-5SP	Screw
4	Cover	21	Prism Seat
6	Cover Plate	3P+8SG	Screw
7	Calibrated Plate	22	Prism Holder
9	Sliding Plate	CA-45	Prism
11	Guide	23	Ring
14	Seat Plate	VT-13	Vertical Tube
KeS	Screw	ZC-5	Screw
2.6P+5SBr	Screw	VT-11	Inner Tube
2T+4SP	Screw	VT-11A	Tapered Ring
5	Cover Plate	3P+6SP	Screw
6	Sliding Plate	FP-2	Joint
S-21	Screw	2B-2.5SCr	Screw
10	Guide	VT-12	Metal Piece
2K8.5SNi	Knock Pin	3S3	Screw
3S3	Screw	2.6S-5SP	Screw
15	Prism Case	CA-46	Prism
CA-23	Prism	CA-44	Prism
2.3P+5SBr	Screw	18A	Binocular Body
3S3	Screw	3T+8SBr	Screw
16	Prism Case	20	Prism Seat
2.3P+5SBr	Screw	CA-45	Prism
CA-22.23	Prism	21A	Seat
3S3	Screw	3P+8SG	Screw
CA-21	Prism		

M4000D Series Monocular Body & Teaching Body PARTS LIST

Part Number	Description	Part Number	Description
1A-1	Eyepiece Tube	4S6	Screw
2-1	Prism Housing	2A-1	Prism Housing
4S6	Screw	4S4	Screw
CA-20	Prism	CA-20, 24	Prism
4S4	Screw	ZC-5	Screw
VT-13	Vertical Tube	VT-11	Inner Tube
2B-2.5SCr	Screw	1A-1	Eyepiece Tube
VT-12	Metal Piece	4S6	Screw
VT-11A	Tapered Ring	3P+10SG	Screw
VT-10A	Adjustment Frame	3m/m W	Washer
2.6M-3SBr	Screw	5A	Prism Seat
VT-10D	Lower Frame	5B	Housing Seat

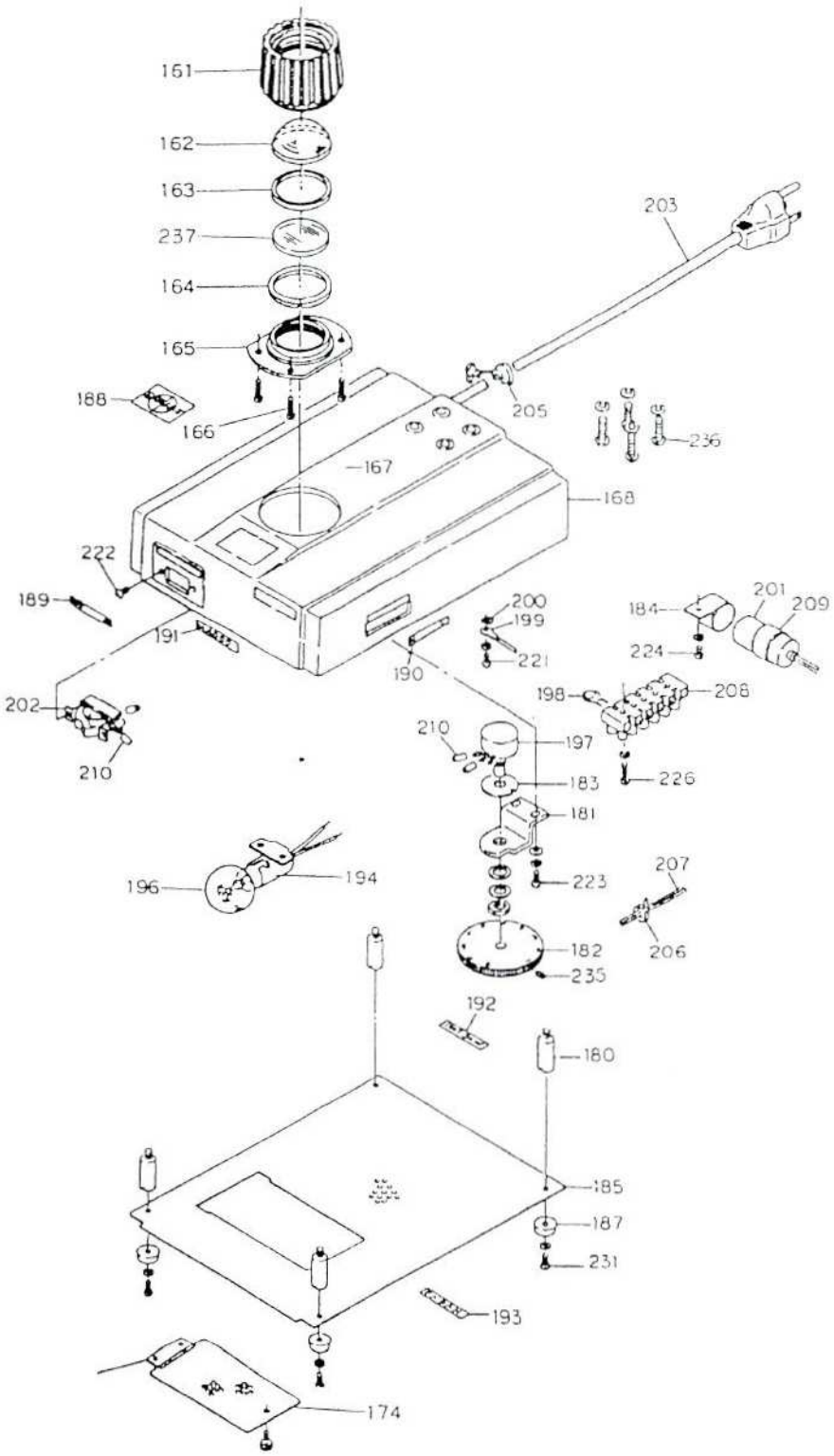
M4000D Series Mechanical Stage



M4000D Series Mechanical Stage

Parts Number	Description	Part Number	Description
241	Stage, Upper	270	Liner
242	Stage, lower	271	Slide Holder
243	Triangular Rail	272	Vernier Scale
244	Ball Guide Plate	273	Stage Clips
245	2.3φ Ball	274	Knock Pin
246	Holder	275	Finger Seat
247	Rack	276	Spring
248	Liner	277	Finger
249	Holder	278	Cap
250	Set Screw	279	Pin
251	Set Screw	280	Screw
252	Verier Plate	281	Screw
253	Venier Seat	282	Knock Pin
254	Vernier	283	Screw 4P + 8SP
255	Marking	284	Screw 4P + 8SP
256	Pinion	285	Screw 3P + 10SP
257	Washer	286	Screw 4P + 5SG
258	Metal	287	Screw 2.6P + 6SP
259	Washer	288	Screw 2.6P(0) + 4PSG
260	Gear	289	Screw 2.3F + 5SP
261	Knob	290	Screw 3S8SG
262	Washer	291	Screw 2S3SG
263	Nut	292	Screw 2.6P + 6SG
264	Washer	293	Vernier Scale
265	Knob	294	Screw 4P + 10SP
266	Triangular Rail		
267	Slider		
268	Rack		
269	Vernier Scale		

M4001D-M4003D Standard Base.

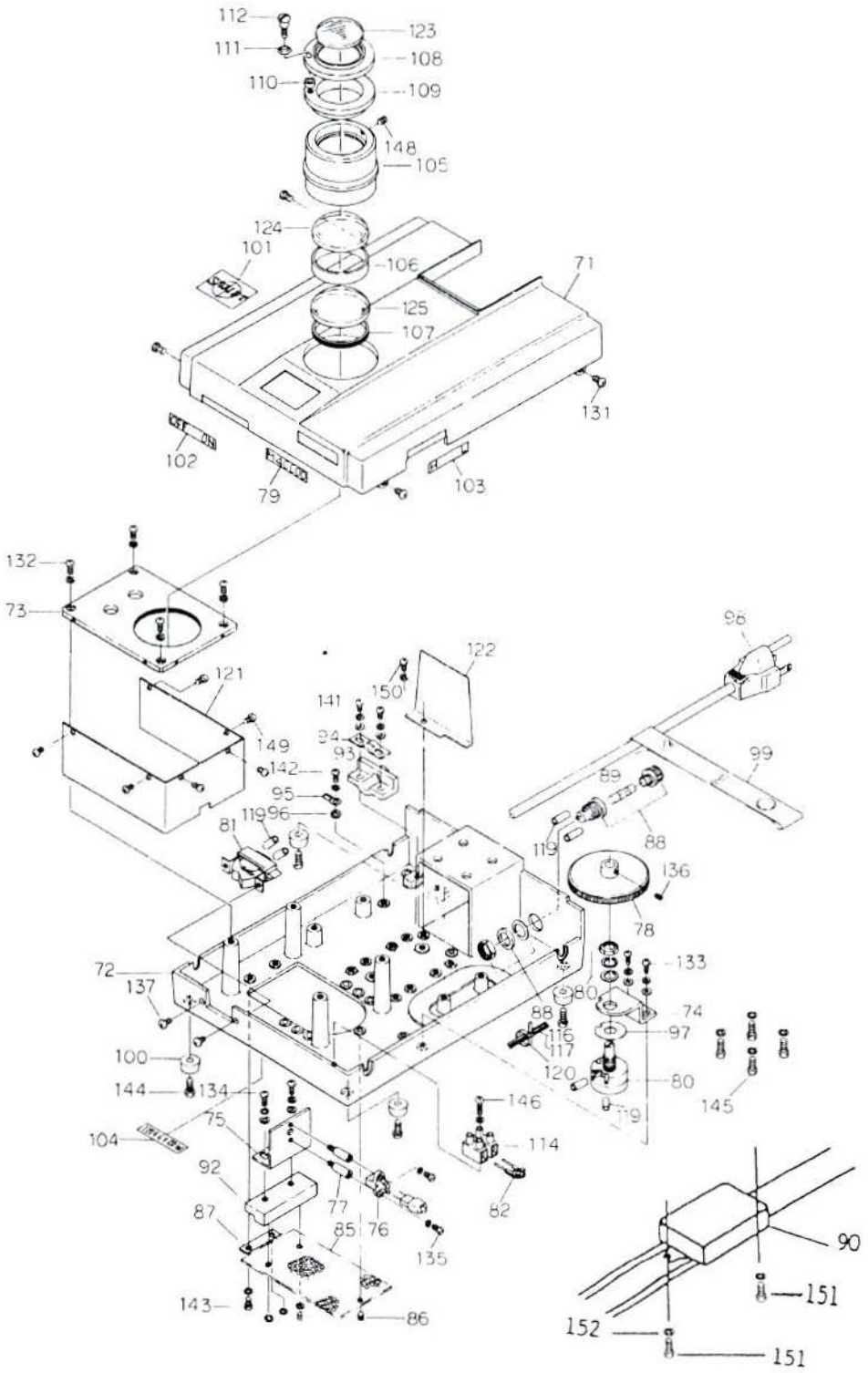


M4001D Base

Parts Number	Description	Parts Number	Description
161	Field Condenser Mount	199	Eargh Lug
		200	Washer
162	Lens	201	Series Regulator
163	Retaining Ring	202	On-Off Switch
164	Spacer Ring	203	Cord
165	Adapter Ring	205	Grommet
166	Screw	206	Cord Band
168	Base	207	No.18 Wire
174	Bottom Plate	208	6P Terminal
180	Rod	209	Insulator Tape
181	L type Plate	210	No.8 Tube
182	Disc	221	4P + 6 SW Screw
183	Washer	222	3T + 6SG Screw
184	Regulator Band	223	SW. W 3P + 8SG Screw
185	Bottom Plate	224	SW 3P + 6SG Screw
187	Rubber Shoes	226	SW 3P + 14SG Screw
188	Marking Plate	231	3P + 10SG Screw
189	On-Off Plate	235	3S4 Screw
190	H-L Seal	236	SW 5P + 1 − SG Screw
191	Marking Plate	237	White Frosted Filter
192	Voltage Seal		
193	Japan Seal		
194	Socket		
196	Bulb		
197	Volume Control		
198	Variable Registor		

M4002D M4004D M4005D

High Intensity Base

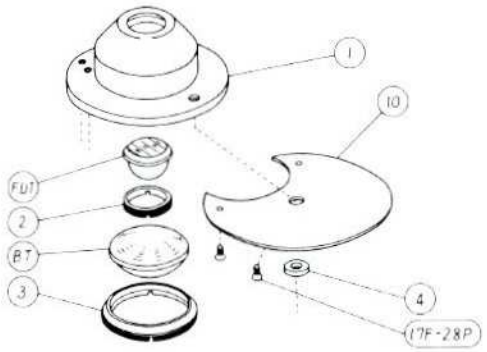


Part Number	Description	Part Number	Description
71	Base, Upper	100	Rubber Shoes
72	Base, Lower	101	Marking Plate
73	Plate	102	On-Off Plate
74	Volume Control	103	Marking Plate
	Holder	104	Marking Plate
75	Socket Plate	105	Field Condenser
76	Socket		Frame
77	Socket Holder	106	Ring
78	Volume Disc	107	Ring
79	Marking Plate	108	Filter Carrier
80	Volume Control	109	Frame
81	On-Off Switch	110	Washer
82	Variable Register	111	Washer
85	Plate	112	Screw
86	Screw	114	Terminal
87	Hinge	116	Tube
88	Fuse Holder	117	Tube
89	Fuse	120	Cord Band
90	Electronic Transformer	121	Cover
92	Seat	122	Cover
93	Grommet	123	Filter
94	Holder	124	Lens
95	Earth Iug	125	Lens
96	Washer	131	3T + 6SP Screw
97	Washer	132	SW 3P + 6SG Screw
98	3-wire Cord	133	SW W 3P + 8SG Screw
99	Cord Band		

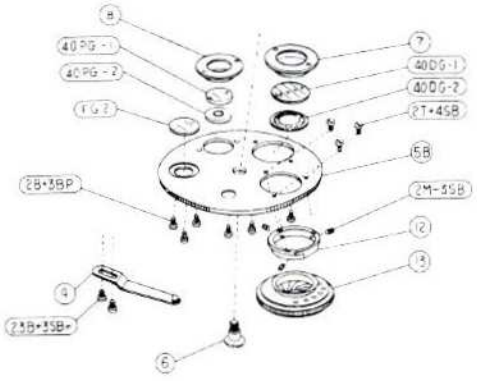
M4002D-M4004D-M4005D High Intensity Base PARTS LIST

Part Number	Description	Part Number	Description
134	SW W 3P + 8SG Screw, Washer, Spring Washer		
135	SW 2P + 12SG Screw		
136	3S4 Screw		
137	3T + 6SP Screw		
141	SW W 3P + 12SG Screw		
142	SW 4P + 6SG Screw		
143	SW 3P + 6SG Screw		
144	DP 3B + 10 Screw		
145	SW 5P + 10SG Screw		
146	SW 3P + 12SG Screw		
148	2.6MC – 6SG Screw		
149	2.6P + 4SP Screw		
150	SW 3P + 6SG Screw		
151	SW 3P + 6SG Screw		
152	Washer		

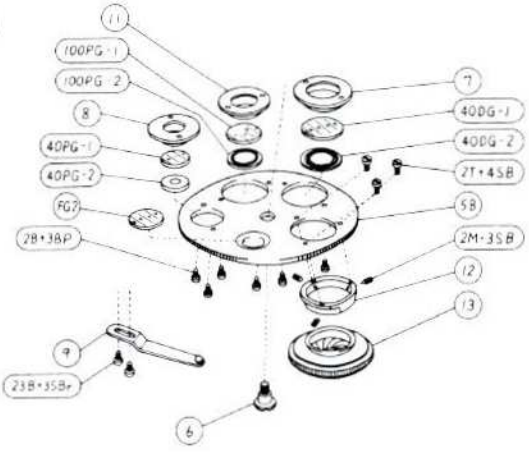
M4000D Series Quodmaster



MA403D



MA404D



PARTS LIST

M4000D Series MA403D Quodmaster MA404D

Part Number	Description	Part Number	Description
1	Condenser Frame	5B	Disc Diaphragm
F.UT	Lens	6	Screw
2	Retainer Ring	7	Frame, Darkfield
BT	Lens	40DG-1	Filter, Darkfield
3	Retainer Ring	40DG-2	Filter, Darkfield
4	Washer	11	Frame, Phase 100X
10	Cover Plate	100PG-1	Filter, Phase 100X
1.7F-2BP	Screw	100PG-2	Filter, Phase 100X
5B	Disc Diaphragm	8	Frame, Phase 40X
6	Screw	40PG-1	Filter, Phase 40X
7	Frame, Darkfield	40PG-2	Filter, Phase 40X
40DG-1	Filter, Darkfield	2B+3BP	Screw
40DG-2	Filter, Darkfield	FG2	Filter
8	Frame, Phase 40X	2T+4SB	Screw
40PG-1	Filter, Phase 40X	12	Joint Ring
40PG-2	Filter, Phase 40X	2M-3SB	Screw
2B+3BP	Screw	13	Iris Diaphragm
FG2	Filter	9	Diaphragm Clip
9	Diaphragm Clip	2.3B+3SB	Screw
2.3B+3SB	Screw		
2T+4SB	Screw		
2M−3SB	Screw		
12	Joint Ring		
13	Iris Diaphragm		

the more commonly used, Cargille Immersion Oil, onto the cover glass. The controls are then manipulated to immerse the front lens of the objective into the oil. This forms an air tight connection through which the specimen may be viewed without interference from the atmosphere. Care must be taken not to come into direct contact between the lens of the objective and the cover glass since this may scratch or otherwise mar the viewing area of the lens itself.

Oil immersion objectives should be cleaned immediately after each use since the oil will dry after a time and prevent satisfactory viewing thereafter.

PROCEDURE FOR ADJUSTING THE SWIFT CO-INCIDENT FOCUS BINOCULAR BODY

1. Adjust interpupillary distance for comfortable viewing. (One field of view).

When your particular interpupillary distance is found note the interpupillary scale reading. (Between eyepiece tubes).

2. Set this reading to each individual eyepiece. (By turning Calibrated Diopter Rings).

3. Focus sharply. If there is a difference in vision (Acuity) between eyes, focus sharply to one eye then adjust opposite Diopter Ring for acuity.

The microscope will now be adjusted to your particular vision requirements and parfocal at all powers.

PHASE CONTRAST WITH THE SWIFT M4000D SERIES MICROSCOPE

The phase contrast microscope reveals fine detail in transparent objects which possess very little contrast. Unstained living organisms and cells can be studied without danger of artifacts produced by killing, fixing or staining reagents. Before the advent of phase contrast such specimens could only be examined in transmitted light by closing down the substage condenser diaphragm to a small aperture. The narrow cone of illumination produced diffraction with destruction of detail.

SWIFT SYSTEM OF QUODLIBET PHASE CONTRAST MICROSCOPY

The Quodlibet system of phase offers phase contrast techniques in a simple form, yet with phase contrasted results comparable to instruments costing many times more.

The SWIFT Quodmaster Phase unit may be ordered as a complete microscope or added to your M4000D Series microscope.

SWIFT QUODMASTER PHASE MICROSCOPY

The Quodmaster Phase Contrast Set includes the following: 4xD Achromatic (scanning lens) 10xD & 40xD phase objectives. Substage, mount centerable, N.A. 1.25 condenser. Five aperture rotatable disc containing one phase annulus common to both 10xD & 40xRD phase objectives. One darkfield stop common to 4xD 10xD Phase and 40xRD Phase objectives. One diffusion filter and one open aperture in addition to an iris diaphragm for brightfield use at all magnifications.

Note: A 100xRD objective is congruent with the iris diaphragm for brightfield oil immersion microscopy.

The SWIFT Quodmaster 100 is the same as above with the addition of a 100xRD Phase annulus in the disc and a 100xRD Phase objective affording phase technique with 10xD, 40xRD, & 100xD Objectives; darkfield technique with 4xD, 10xD, 40xRD objectives; brightfield with 4xD, 10xD, 40xRD including 100xRD oil immersion.

The Swift M4004D and M4005D Quodmaster Phase System offers phase contrast techniques in a simple form – yet with phase contrast results comparable to units costing much more.

Its use is simple and effective – just match the objective to the condenser position.

The M4004D Quodmaster 100 Condenser, has the following preset optical specifications and markings:

B = Brightfield (position), which has a N.A. 1.25 Condenser with iris for use with the 4X, 10X, 40X, and 100X (oil) Objectives. The condenser is on a rack & pinion.

F = Filter (position), also for brightfield use as above.

△ = Green Triangle – this position has a phase annulus for use with the Phase 10X and 40X Objectives. Please note: the condenser must be racked to the full up position during this procedure.

△ = Red Triangle – this position has a phase annulus for use with Phase 100X (oil) Objective. The condenser must be in the full up position.

D = Darkfield Stop, for low power darkfield with the 4X, 10X, and 40X Objectives only. The condenser must be in the full up position.

Specifications for the M4005D Quodmaster Model are the same as above, except it is without the 100X phase annulus (Red Triangle position), which allows only brightfield use with the 100X oil Objective, (for Blood platelet use).

FOR USE WITH:
BRIGHTFIELD – B&F
PHASE GREEN TRIANGLE – △
DARKFIELD – D
FOR USE WITH:
BRIGHTFIELD – B&F
PHASE GREEN TRIANGLE – △
DARKFIELD – D
FOR USE WITH:
BRIGHTFIELD – B&F
PHASE RED TRIANGLE – △
FOR USE WITH:
BRIGHTFIELD – B&F
DARKFIEDL – D
P10X - PHASE OBJECTIVE
B = BRIGHTFIELD POSITION
P40XR PHASE OBJECTIVE
P100XR - PHASE OBJECTIVE
4X - BRIGHTFIELD OBJECTIVE
F = FILTER FOR 4X - 10X - 40X - 100X BRIGHTFIELD
D = DARKFIELD STOP FOR 4X - 10X & 40X OBJECTIVES
△ = GREEN TRIANGLE FOR PHASE 10X - 40X OBJECTIVES
△ = RED TRIANGLE FOR PHASE 100X OBJECTIVE

ADJUSTMENT OF SWIFT KOEHLER ILLUMINATOR ON M4003DM

As the koehler system of illumination is simple to adjust and align, we recommend the following procedure.

1. It is required that any frosted or diffusing filter be removed from the optical path, and unfrosted or neutral density filter can be inserted into the optical path if desired.
2. Select a low power objective (10X), insert a specimen slide and focus the specimen.
3. Close the collecting lens (field) diaphragm.
4. The image of the field diaphragm should be centered in the field of view by adjusting the condenser centering knobs, or screws.
5. The field diaphragm should then be opened until the image of its edges just disappears from the field of view (the image of the field diaphragm should exit from the field of view).
   If the above does not take place, re-center and repeat the above operations. Upon completion of the above steps, you will have obtained Koehler illumination.

CARE OF YOUR SWIFT M4000D SERIES MICROSCOPES

Your SWIFT M4000D Series microscope is a precision instrument and requires only routine maintenance. With ordinary care, the microscopes will last a lifetime. Microscopes like other precision instruments should be cleaned after each use, which prevents dust and other forms of contaminents from drying on exposed surfaces.

Eyepiece and objective lenses should never be wiped while dry. Particles of dust should be removed using a soft camels hair brush or air. Lens paper folded several times and moistened with an approved lens cleaner such as Xylol or Xylene should be used to clean glass surfaces. Lenses should never be disassembled except by qualified, authorized technicians.

The painted metal surfaces of your SWIFT M4000D Series microscopes are finished with a formula of epoxy-ester-resin, and are resistant to staining or dulling from most reagents found in classrooms or laboratories. The finish should be wiped off periodically with a soft, moistened piece of flannel or chamois.

Periodic servicing is recommended. This should be done only by qualified technicians since general servicing includes disassembly, cleaning and relubrication. Also, at this time all parts are tightened and inspected for wear. Periods of maintenance will vary depending on the hours of use of the microscope each day. Some schools will find servicing every three years adequate, while others will require more frequent attention.

SWIFT M4000D Series microscopes operate best when lubricated only with lubricants recommended by SWIFT. Depending on the climate, moisture will evaporate from lubricants over a period of time, usually about three years. At that time, the lubricant no longer performs its function and should be removed and replaced to ensure ease of operation in the movement of parts on their bearing surfaces.

Your SWIFT M4000D Series microscope is covered by the most liberal warranty available, which is printed within all SWIFT brochures and is backed by a fully stocked and manned plant in San Jose, California, U.S.A., as well as service dealers in most states and many countries of the world.

INSTRUCTIONS FOR REPLACING BULB (LAMP)
M4000D SERIES MICROSCOPE BASES

M4001D/M4002D

1. Unscrew the set screw on the lid on the bottom plate.
2. Pull the lid out.
3. Replace lamp and re-assemble.

M4003D

1. Unscrew the plus screw on the back plate of the lamp housing.
2. Pull the lamp housing out.
3. Replace lamp and re-assemble.

Inquiries regarding the SWIFT M4000D Series or other SWIFT products should be directed to your authorized SWIFT dealer, or:

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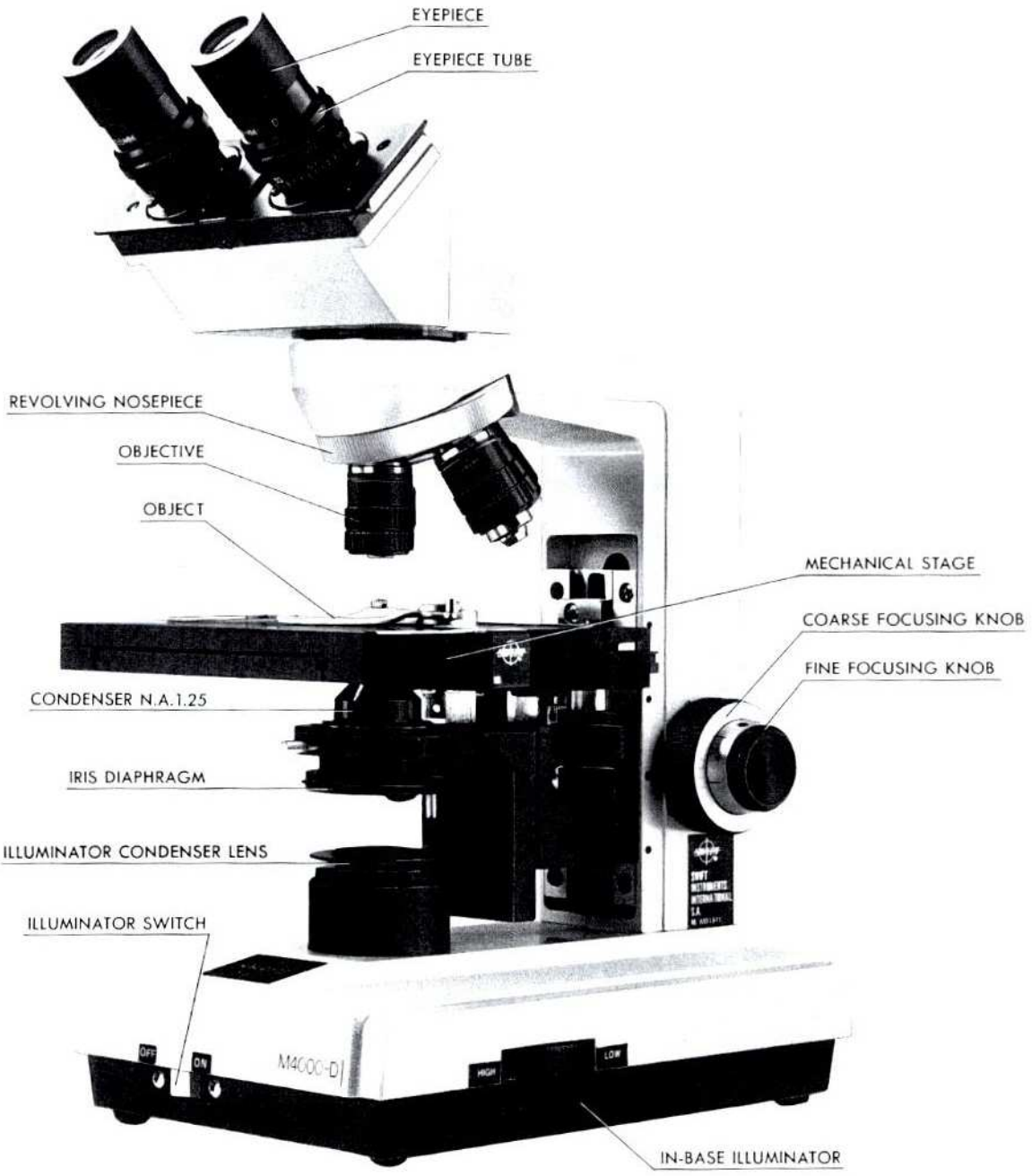
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